SRNT 4/26/05

10675207 Measuring Temperature OF ROTATING EQUIPMENT with Sealed Bearings

Type	Ref#:	Hits	Search Text	DBs	Time Stamp	Comments
IS&R	S74	7030	((374/153) or (374/102) or (374/57) or (374/120) or (374/45) or (374/4) or (374/141) or (340/589) or (340/682) or (384/448) or (384/624) or (73/116) or (73/168) or (702/34) or (702/130) or (702/132) or (702/134) or (417/32) or (417/13) or (417/63)).CCLS.	US-PGPUB; USPAT	4/26/05 9:11	
BRS	S76	84	S74 and @pd > "20050228"	US-PGPUB; USPAT	4/26/05 9:24	browsed for update
Type	Ref#:	Hits	Search Text	DBs	Time Stamp	Comments
BRS	L3	7	((Lindberg adj S) and (Hedlund adj H) and (Kummelstam adj J) and (Lindberg adj J)).in.	US-PGPUB; USPAT; EPO; JPO; DERWENT	4/26/05 14:07	inventors of US 2005/0049801 A1
BRS	L4	1	1998-101261.NRAN.	DERWENT	4/26/05 14:17	Finds 17 Documents. FAMILY SEARCH.
IS&R	L5	2	(("6499349") or ("6725723")).PN.	US-PGPUB; USPAT	4/26/05 14:34	two USPATS from above Derwent Family Search.
BRS	L6	52	("3848112" | "3913084" | "4121574" | "4280185" | "4408285" | "4426641" | "4520674" | "4530240" | "4550311" | "4559828" | "4612620" | "4615216" | "4621263" | "4669315" | "4721849" | "4768380" | "4800512" | "4827771" | "4885707" | "5162725" | "5191327" | "5206818" | "5251151" | "5257208" | "5319962" | "5335186" | "5377128" | "5379643" | "5430663" | "5479359" | "5501105" | "5511422" | "5515266" | "5517183" | "5530343" | "5533413" | "5544073" | "5555457" | "5579241" | "5584796" | "5586305" | "5663811" | "5808903" | "5992237" | "6006164" | "6078874" | "6202491" | "6208944" | "6499349").PN. OR ("6499349" | "6725723").URPN.	US-PGPUB; USPAT; USOCR	4/26/05 14:34	JANUS forward and backward citations from the two above patents as the "kernel".
BRS	L7	14	(US-6725723-$ or US-6672168-$ or US-6499349-$ or US-6202491-$ or US-6078874-$ or US-6006164-$ or US-5992237-$ or US-5808903-$ or US-5533413-$ or US-5377128-$ or US-4827771-$ or US-4800512-$ or US-4612620-$ or US-4121574-$).did.	USPAT	4/26/05 15:16	pagemarked in the above search. See next...
BRS	L8	10	7 and temperature	US-PGPUB; USPAT	4/26/05 15:55	marked up
IS&R	L12	4	(("4,885,707") or ("4,773,766") or ("6,312,226") or ("6,092,370")).PN.	US-PGPUB; USPAT	4/26/05 16:24	previously considered...

	[redacted]	Document ID	Image Document ID	Source	Page#	Comment
1	☐	US 6499349 B1	US 6499349	US Full	1	The operating condition can be determined by measuring the amplitude of vibrations in a bearing and by measuring temperature changes on the casing of the machine, which temperatures are dependent on the operating condition of the bearing.
2	☐	US 6078874 A	US 6078874	US Full	8	Col. 2, Lines 1-4 -- different types of sensors, including temperature ---
3	☐	US 6078874 A	US 6078874	US Full	9	Col. 3, Lines 8-12, art recognized equivalent sensors include temperature sensor: "A variety of sensor types may be employed in the practice of the invention. For example, the first sensor may be a vibration transducer which senses vibrations produced by the machine. Another sensor is a temperature sensor useful for sensing the temperature of the machine during operation."
4	☐	US 5808903 A	US 5808903	US Full	7	PUMP data
5	☐	US 5808903 A	US 5808903	US Full	10	portable data collector
6	☐	US 5808903 A	US 5808903	US Full	12	Col. 6, Lines 55-60 -- may include various combinations of machine parameters (in addition to vibration and acceleration)
7	☐	EP 909430 B	WO 9801831 A1	Foreign Full	1	(Empty)
8	☐	WO 9801831 A1	WO 9801831 A1	Foreign Full	1	(Empty)
9	☐	US 20010001136 A1	US 20010001136	US-PGPub Full	1	(Empty)
10	☐	EP 909430 B1	EP 909430 B1	Foreign Full	1	(Empty)
11	☐	EP 1124204 A2	EP 1124204 A2	Foreign Full	1	(Empty)
12	☐	US 20010001135 A1	US 20010001135	US-PGPub Full	1	(Empty)
13	☐	US 4800512 A	US 4800512	US Full	1	In rotary engines or power units or sets, such as for example in the case of pumps, generators, fans, turbo-sets, compressors and the like, study of the running behavior is carried out at more or less regular intervals, with a view to detecting possible changes. These changes can lead for example to oscillations or pulsations and can be due to intermittent or shock pulses or wave emission conditions of the bearing (unbalanced), and as a result of temperature changes in the machine housing and in the bearings. Monitoring of the running behavior of such rotary machines is of great importance both for the safety and maintenance of such machines, as well as to ensure that their life is not shortened.
14	☐	US 6829542 B1	US 6829542	US Full	1	(Empty)
15	☐	US 6312226 B1	US 6312226	US Full	1	(Empty)
16	☐	US 4773766 A	US 4773766	US Full	1	(Empty)
17	☐	US 6092370 A	US 6092370	US Full	1	The first temperature sensor may be coupled to the pump head proximate to the seal and the second temperature sensor may be coupled to the pump head at an end-cap housing the outlet chamber. The first and second temperatures measured by the first and second temperature sensors are compared with first and second reference temperatures to determine whether either the inlet check valve, the seal, or the outlet check valve is malfunctioning prior to causing a severe failure of the pump head.
18	☐	US 4885707 A	US 4885707	US Full	1	(Empty)

SRNT 4/26/05

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1	☒	US 6499349 B1	US 6499349	US Full	1	The operating condition can be determined by measuring the amplitude of vibrations in a bearing and by measuring temperature changes on the casing of the machine, which temperatures are dependent on the operating condition of the bearing.
2	☒	US 6078874 A	US 6078874	US Full	8	Col. 2, Lines 1-4 -- different types of sensors, including temperature ---
3	☐ (Dup)	US 6078874 A	US 6078874	US Full	9	Col. 3, Lines 8-12, art recognized equivalent sensors include temperature sensor: "A variety of sensor types may be employed in the practice of the invention. For example, the first sensor may be a vibration transducer which senses vibrations produced by the machine. Another sensor is a temperature sensor useful for sensing the temperature of the machine during operation."
4	☐	US 6725723 B2	US 6725723	US Full	1	The operating condition can be determined by measuring the amplitude of vibrations in a bearing and by measuring temperature changes on the casing of the machine, which temperatures are dependent on the operating condition of the bearing.
5	(IDS)	US 6202491 B1	US 6202491	US Full	1	A vibration coupling stud for use in a vibration monitoring system includes digital memory and temperature sensing devices.
6	(IDS)	US 6006164 A	US 6006164	US Full	11	{See Fig. 14} As bearing housing temperature is an important parameter in addition to the various forms of vibration data, the stud 14 may include an integral digital temperature sensor IC as set forth above, and therefore digital temperature data may also be retrieved at step 154. As will also be described below, the data stored in the stud may additionally comprise prior time and date stamped vibration and temperature measurements made at that measuring point.
7	(IDS?)	US 6006164 A	US 6006164	US Full	12	Alternative to continuous monitoring at all points -- less expensive portable monitoring probe (Col. 1, Lines 55-65)
8	(IDS)	US 5533413 A	US 5533413	US Full	1	Various kinds of sensors SN are provided at suitable locations on each equipment and serve to detect information on stress applied to the diagnosis target equipment. The diagnosis equipment may comprise dynamic equipment, such as valves, pumps, arc, and static equipment, such as heat exchangers, distillation columns, etc. The sensors SN may comprise vibration sensors, temperature sensors, thickness sensors, acoustic emission (AE) sensors, and the like.
9	☐ (No Cite)	US 5377128 A	US 5377128	US Full	1	instrumentation system includes a hand-held computer-based measuring meter having a visual display and a plurality of individual sensor modules that can be selectively coupled to the measuring meter for measuring one of a variety of parameters such as temperature, pressure, or the like. Each sensor module includes a sensor responsive to a particular stimulus, as well as a data memory for storing information about the sensor.
10	☐	US 4800512 A	US 4800512	US Full	1	In rotary engines or power units or sets, such as for example in the case of pumps, generators, fans, turbo-sets, compressors and the like, study of the running behavior is carried out at more or less regular intervals, with a view to detecting possible changes. These changes can lead for example to oscillations or pulsations and can be due to intermittent or shock pulses or wave emission conditions of the bearing (unbalanced), and as a result of temperature changes in the machine housing and in the bearings. Monitoring of the running behavior of such rotary machines is of great importance both for the safety and maintenance of such machines, as well as to ensure that their life is not shortened.
11	☐ (No Cite)	US 4121574 A	US 4121574	US Full	1	method and apparatus for measuring and displaying the vital signs of a patient wearing an alpha-numeric identification bracelet, including a temperature sensing probe for making body contact with the patient, a portable, data-gathering acquisition unit and...

SRNT 4/26/05